

TOPOLOGY SEMINAR

Guest Speaker: Nicholas Scoville

Ursinus College

Date: Tuesday, October 24, 2023

Time: 2:30 PM

Location: 258 Hurley Bldg

Zoom Link: NA



Lecture Title:

A McCord theorem for Cech closure spaces

Abstract

In this talk, we verify analogues of classical results for higher homotopy groups and singular homology groups of Cech closure spaces. Closure spaces are a generalization of topological spaces that also include graphs and directed graphs and are thus a bridge that connects classical algebraic topology with the more applied side of topology, such as digital topology. Our main result is the construction of a weak homotopy equivalence between the geometric realizations of (directed) Vietoris-Rips complexes and their underlying (directed) graphs. This implies that singular homology groups of finite graphs can be efficiently calculated from finite combinatorial structures, despite their associated chain groups being infinite dimensional. This work is similar to the work McCord did for finite topological spaces, but in the context of closure spaces. This is joint work with Nikolai Milicevic.